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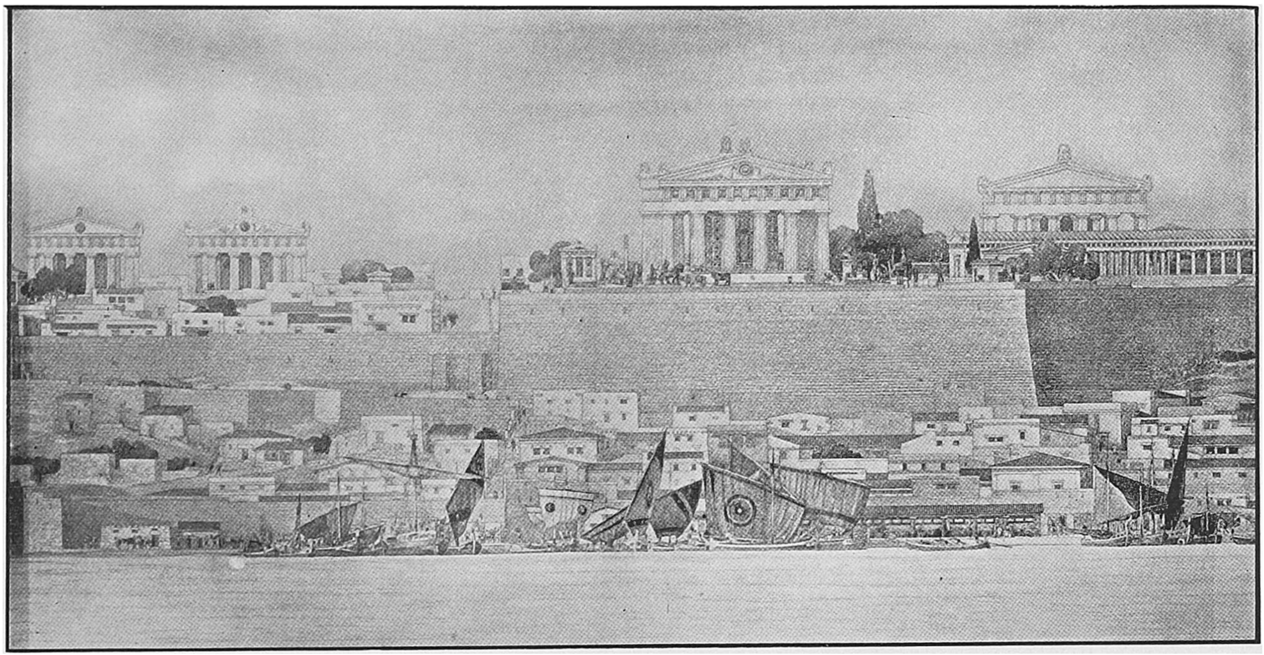

SELINONTE

DORIC COLONY IN SICILY AT END OF FIFTH CENTURY B. C.

THE CLASSIC ORDERS OF ARCHITECTURE

BY EGERTON SWARTWOUT, F.A.I.A.

PART II. THE DORIC ORDER

THE column, with its entablature, which, taken in its entirety, is architecturally termed an order, is nothing but an ornamental form of support, and is as old as architecture itself. In the first traces of civilization, where any architectural ruins remain, there are always indications of some form of support other than that of the walls. A tent pole or the trunk of a tree used as a support for the rustic shelter of some savage, a roughly hewn block of stone set laboriously upright in the ground—all these are the primitive expression of the column. Such an upright support, with the rude beam which it carries, is the prototype from which, by slow degrees, the order, as we now know it, has been developed. In different countries it has developed along different lines and to different degrees of perfection. In Egypt, owing perhaps to physical and climatic conditions, its development is almost entirely lithic, although there is undoubted reason to believe that the column and the lotus cap are expressions in stone of a primitive post, made by binding together numbers of stout reeds; while the cavetto cornice is reminiscent of the ends of the wattled reeds of the clay wall, forced outward at the top by the weight of the earthen roof. However this may be, the Egyptian column, as we find it at the drawings of history is a well-developed stone form, and this at a period when the Babylonian palaces were of sun-baked bricks, and the temples of the Greeks were mere rustic shrines,

From this priority of civilization and this early development of architecture in stone, there has been a disposition on the part of many archeologists to attribute to Egyptian influences the Doric order, as found in Greece. A claim has been made that certain columns at Beni-Hassan and other places in Egypt are the definite prototypes of this order, and at first sight there seems to be some good reasons for this belief. These columns certainly do bear a general resemblance to the Doric column, and they antedate the Doric by a considerable period, and it is a well-known fact that the Greek sailors and merchants were at an early age well acquainted with Egyptian civilization. But it is just this great priority of construction that is suspicious. Why should the Greeks copy an Egyptian form of order already centuries old, found in an out-of-way part of the country; and, more than all, an order which the Egyptians used but little and never developed? Surely the wise Greeks would have copied the fully developed lotus cap and the coilanaglyphic decoration of the monumental temples, if they copied at all. Or even, if it was conceivable that they had adopted the Beni-Hassan column, would they not also have adopted the entablature? But the Beni-Hassan entablature is a distinct reminiscence of the reed and pole type, with its superincumbent earthen roof—absolutely dissimilar to the Doric entablature. This imagined development from an Egyptian prototype has been popular for many years, as it provided the simplest explanation, but it is now generally questioned, and the development of the Doric order sought in Greece itself.

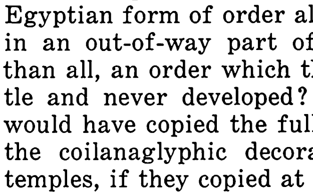

FIG. 1—ENTRANCE TO TOMB AT BENI-HASSAN, EGYPT

Is it not possible that different nations, working centuries apart, might develop similar types under similar conditions? This is not only conceivable.

but probable, especially when the object to be developed is of such a simple type and of such common proportions as the column.

Primitive man erects a wooden post for the support of his roof. It may be a tree trunk, or it may be roughly squared, according to his knowledge of tools and his ability to use them. On the top of this post he rests his beam, and in order to secure adequate bearing for the beam, he crowns his post with a flat piece of wood. This piece of wood is oblong and extends on either side of his post, to give better bearing to the beam; it even becomes a bracket at times; and then as he acquires more skill, he chamfers the edges of his square post, and it becomes octagonal; chamfering it again the post becomes a sixteen-sided pillar, and if these chamfers are slightly hollowed, and thereby lend more grace and color to the shaft, they straight away become flutes. The shaft is tapered toward the top and becomes a more structural form, and a natural form—a form seen in the trunks of the pines around him—and more than all, it is a pleasing form—for the savage is now progressing. He has acquired some knowledge of æsthetic values; he seeks the beautiful; he is groping, a little blindly perhaps, but still laboriously seeking the vague expression of something more beautiful. Similarly, the bracket over the post is found unpleasing; it is unsymmetrical, and found by experience to be unnecessarily long, and it is therefore shortened, and becomes a square—and by that step the savage has reached the same level as the artisan of Beni-Hassan. He has, without copying, arrived at the same natural result. He goes further. The transition between the round and the square is still displeasing; it is too abrupt. He introduces a roughly rounded moulding between the top of the shaft and the block or abacus, and the thing is done. He has made a Doric column. It is a simple thing really, an easy transition from the square to the round, which is the fundamental principle of all decorative forms of support, the basis of all orders—and, considered in this light there are only two Classic orders, two definite forms, although these two have the one common origin. The first is a rational structural form, which may be simple as the Doric, or decorated as the Corinthian; and the second is unstructural, a purely decorative form—the Ionic. If this seems a startling statement, look at it graphically, or, better still, consider it from a model. What is the echinus of a Doric cap but a method of transition from the round to the square? The same transitional form is to be observed in the bell of the Corinthian cap. It is decorated, it is true, and the abacus has been lightened, and has taken on a pleasing curve, but the same principle is there. Seen in perspective, the relation betwen the Doric and the Corinthian is similar, the transition between the two orders being shown, though not as a chronological development, in the capital of the little Klypsedra of Andronikos Kyrrhestes, better known as the Tower of the Winds.

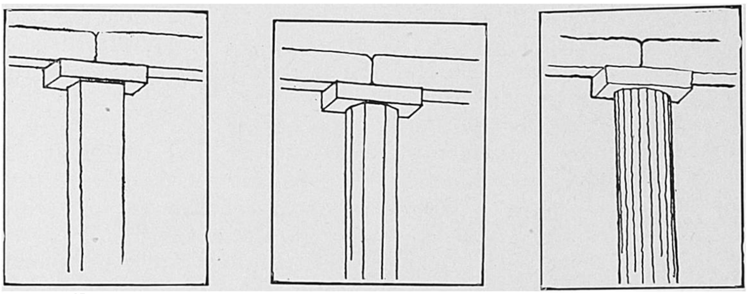
Fig. II, A, B, C—Development of Primitive Post and Cap

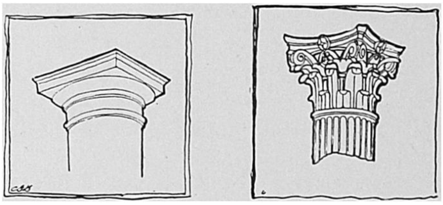
Fig. III, A and B—Similarity Between the Doric and the Corinthian

In the case of the Ionic order, which will be considered in detail in another chapter, the origin is the same, but its development has been along less rationally constructive lines. The bracket over the column has retained its elongated form, the ends have become rounded and decorated with a scroll. It is a purely ornamental and not structural form.

Any hypothesis of a wooden and not a lithic origin for the Doric column has many opponents and few defenders. The opponents start with the assumption that the Doric form is essentially lithic. They point always to the prototype of Beni-Hassan, and to the extreme heaviness of the columns in the earlier temples of Sicily, as compared with the loftier proportions of the Parthenon, and the meagre outlines of the later work. This is, they say, the natural development of time. The early columns were unduly heavy, because of their development from the rough-hewn boulders, and they became gradually slighter as art progressed and construction was better understood, while the reverse would happen if they were copied from a wooden prototype. But, although they decry a wooden origin for the column, they accept it willingly for the entablature. They fail to explain why a stone form, copied from Egypt, is used for the column, in conjunction with an entablature which they admit is a stone expression of a wooden prototype, a prototype not taken from Egypt, as was the column, but of distinctly Grecian origin.

On the other hand, it is sometimes held, notably by Perrot and Chipiez, that while the columns as well as the entablature of the primitive Greek temples were of wood, the prototype of these wooden columns must be sought in Mykenai. They claim that the curious columns at the entrance to the Tholos of Mykenai were stone expressions of the wooden columns of the period; that their wooden origin is plainly shown by their unusual shape, and that this shape is even now commonly used as a wooden form for table and chair legs and the like; that these wooden columns rested upon stone sockets, to give them greater stability, and to prevent decay; and that these sockets

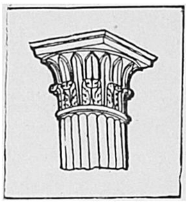
Fig. 4 — Capital, Tower of the Winds

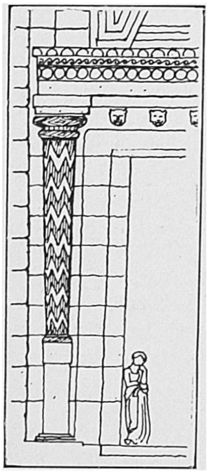

Fig. 5.—Tholos of Mykenai

are the primitive expression of the Classic base. As evidence that the wooden column was used extensively in Greece, reference is made to an extract from Pausanias, who in the Second Century, A. D., describing the Heraion at Olympia, says that there was still one wooden column remaining. From this remark and from certain records, it is generally held that the original Heraion, which certainly antedated the first Olympiad, and which, therefore, was probably built in the early part of the Eighth Century, B. C., was constructed entirely of wood, with the exception of the stylobate and cella, the latter being originally brick; and that being a shrine of especial sanctity and the repository of the most precious ornaments [for it was here that the Hermes of Praxiteles was found] the wood columns were either, on account of their decay, or as an act of piety replaced one by one by columns of stone. This is evident, not only from the records but from the curious fact that nearly all of the fragments of columns and of caps which remain are of different sizes and outlines, and undoubtedly belong to different eras; and it is, therefore probable that the one column observed by Pausanius was the last remaining vestige of the wooden colonnade which once existed. The entablature, as well as the roof, was undoubtedly of wood, as it is inconceivable that wooden columns would be used to support an entablature of stone, and this is borne out by the fact that no vestiges of any stone entablature are found in the ruins.

The hypotheses, then, of Perrot and Chipiez would seem to be that the early form of wooden column in the Heraion and elsewhere was similar to the inverted Mykenian prototype, but that, when the Greeks began to use stone for their columns, they considered that the inverted, truncated cone was not a structural lithic form, and therefor they inverted the column, so that it tapered to the top, instead of to the bottom. This theory, though ingenious, raises several striking objections. Is it safe to assume that the columns at Mykenai were copied from a wood prototype, simply because the same shape is a common form in wood furniture? While it is perfectly true that this form is graceful when used for such purposes, it is inconceivable in its use as a column, especially for a series of free standing columns or for a portico. A temple the size of the Heraion, with its comparatively large columns, would be ridiculous if those columns were practically inverted, nor does it seem that this form is a structural one for a wooden column of any size. It is not only opposed to every law of stability, but it is bad structurally. The logical form to give the greatest strength would perhaps be a column that was slightly bowed in the middle. There is apparently every indication that these columns of Mykenai were expressions in stone, not of wooden, but of a metal column, or possibly a wooden core covered with metal. The curious zigzag ornament which is a distinct reminiscence of a beaten metallic form, would tend to confirm this, as would also the very general use of gold or bronze plating in the works of that period. Another objection would be the sudden inversion of the column in the change from wood to stone. The development of the column and the temple is everywhere so gradual that such a revolutionary change seems almost inconceivable and further, the Heraion would have presented a most curiously unpleasing appearance with half of its columns retaining the inverted wooden form, while the other half were stone, with the normal shape.

If, then, the Mykenian prototype is decarded, it would appear that there was in Greece from the earliest times a wooden form of column, and that this wooden column was not dissimilar in appearance from the Doric column as we see it in stone, with the exception that, on account of the material used, it was undoubtedly of slighter proportions. Viewed in this light, the Heraion with its wooden columns becomes an architectural possibility, the substitution of stone columns for the wood becomes possible without committing an architectural solecism, and the Heraion is then the prototype of the Parthenon.

As to the entablature of the Doric order, it is now a universally accepted fact that the origin of the most monumental form known to architecture must be sought in the rough wooden covering of the Mykenian *megaron,* the great house of the these early temples were probably a development of the Mycenian megaron, the great house of the tribal leader or petty king. In this megaron may be traced the origin of the cella or *naos* of the later temple; the megaron being usually a small rectanular building, with either a door at the narrow end, or later a shallow recessed portico, the roof over the portico being supported by two primitive columns *in antis,* a form which, even in Classic times, is used for the smaller temples. This megaron was covered, not with a flat roof of earth, as was customary in the drier climates of the East, but with a pitched roof, supported by simple carpentry forms, and probably in the earlier times covered with a protective coating of clay. The heavy beams or girders which carried the king-post for the support of the rafters rested on and projected to the outer edge of the rough stone wall, the intervals between these girders being probably in the early times left open. The beams themselves were possibly composite, as with the limited means at their disposal it would have been difficult to have fabricated or erected a solid wooden beam of the size that the early carpenter seemed to think necessary. If it can be assumed that there were three beams making up the one solid girder, a construction which is recalled in the vertically tripartite division of the stone architraves of Classic work, it would be extremely natural and in keeping with the chamfering of the shafts of the columns also to chamfer the edges of these

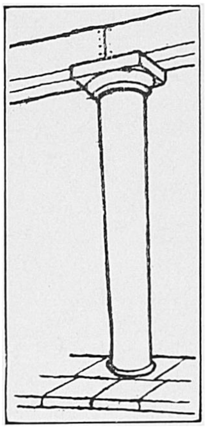

Fig. 6—Primitive Greek Column from Perrot and Chipiez

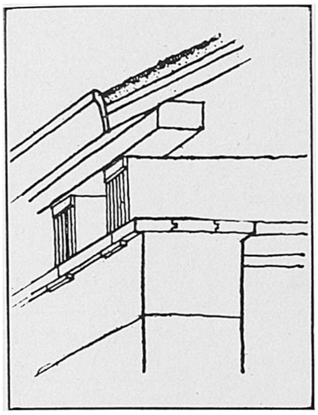

Fig. 7—Wooden Origin of the Doric Entablature

beams. This, then, would form a primitive *triglyph.* It is natural also to assume that on top of the rough stone wall was placed a wall plate to provide a better bearing for the ends of the girders, and to secure this plate to the wall below, small pieces of wood being the *regulae* found under the triglyphs, the *guttae* being the wooden pegs by which these were secured to the projecting wall plate, which is expressed by the *taenia.* In a similar manner, the soffit of the Classic cornice is reminiscent of the rafters. The slope of the roof is clearly indicated, the *mutules* recalling the covering of the rafters, secured in the same manner as the tænia by the wooden pegs or guttæ. The projecting ends of the rafters were then covered by the *cymatium,* which not only made a more finished appearance, but held in place the clay roof. It is probable that in the primitive form of the megaron or the small temple "in antis" the entablature over the columns was not originally treated in the same manner as the entablature of the side walls; in other words, the primitive triglyphs possibly did not appear here or in the rear walls, but were afterwards added as a purely decorative form, to complete the symmetry of the entire building. Similarly, when the primitive temple was enhanced in dignity by the surrounding portico of columns—becoming in this way the prototype of the peripteral stone temple—the triglyphs and metopes were used —purely as decorative forms, the architrave representing a portion of the wall of the temple itself. In this translation of wooden forms the soffit of the cornice gradually lost its original significance; the upward inclination does not always coincide with the slope of the roof, and this same inclination was even repeated at the front and rear, for its decorative and symmetrical effect.

It has been held by some distinguished archeologists that the triglyph did not represent the ends of the beams, but that it was a distinctly stone form, even in earlier temples. By this hypothesis it was assumed that the roof beams rested not on the wall but on a series of short stone uprights, which were channeled like the columns below, and that the spaces between these stone supports were left open for the purpose of admitting light, or were filled, either permanently or on occasion, with trophies and offerings to the gods. The reasons given for this hypothesis seem to be chiefly, that in the Classic temples the level of the ceiling for the *pteroma* is above the upper level of the triglyphs, and that the pteroma ceiling was undoubtedly in the same relative position as the ceiling of the primitive *naos,* and that the triglyphs, therefore, cannot be held to indicate the ends of the beams. It would seem, however, that there was not sufficient room above the triglyphs for the heavy roof beams that, from their lack of knowledge of the principles of the truss, the Greeks thought necessary; and if it is granted that by the time the temples were made peripteral the triglyph and metope forms had become established, or had perhaps acquired some mystical significance, and were used frankly for their decorative or religious value, then it is evident that these reasons for the stone origin of the triglyph cease to have significance.

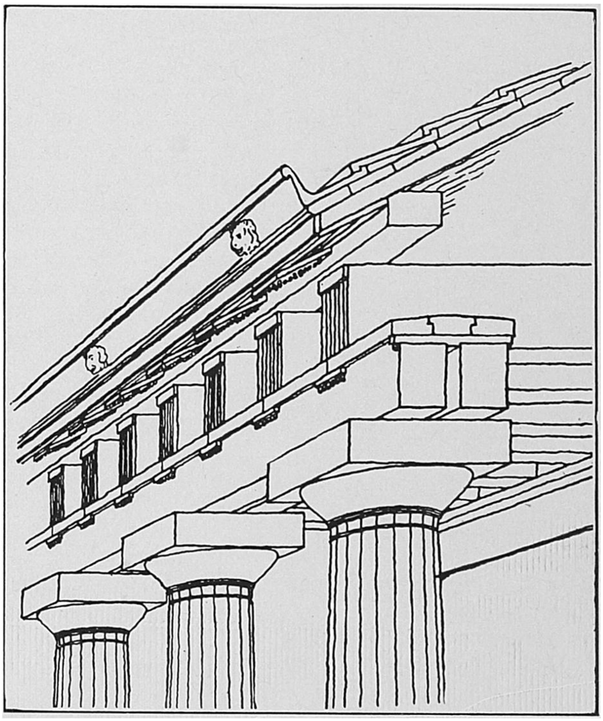

Fig. 8—Doric Entablature in Wood After Gaudet

Another point which is advanced in support of this theory is based on an extract from Euripides. In Iphigeneia in Tauris, Orestes is made to enter the temple through the metopes, or rather between the triglyph, steal the sacred statue of the goddess, and make his escape by the same difficult route. The assertion is made that if the triglyphs were conceived to be the beams of the ceiling of a small non-peripteral temple, Orestes, on passing through the metopes, would find himself above the ceiling; otherwise, if the temple were conceived to be peripteral, he would go to the extreme trouble of clambering through a narrow hole in order to gain access to the perfectly open portico of the temple, or possibly find himself in the *pronaos,* shut off by the brazen gates from the image he sought; and there has also arisen in this connection a question as to the exact meaning of the Classic expression "metope," which would seem from its derivation to mean, "the space between the openings," and this has been interpreted by some to mean that the metopes were always closed, and that reference was made to an opening left in the wall for the reception of the beams, it being advanced in support of this theory that in no Classic work is the

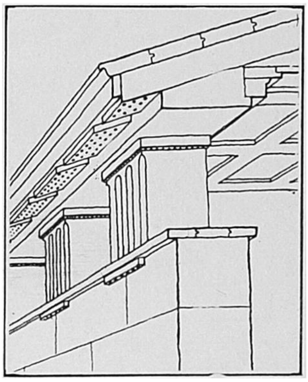

Fig. 9—Stone Origin of Triglyphs After Gaudet

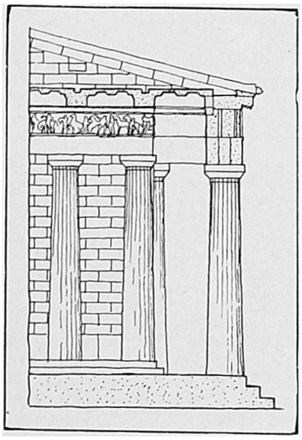

Fig. 10—Section Through Pteroma

wall behind the metope constructed in a way which would indicate that there was once an opening at that point, and further, that in some of the most ancient temples in Sicily the triglyph was sometimes cut from the same piece of stone as the metope itself. Objection is made to the designation in this theory of the space left for the reception of beams as an opening. If such an opening did exist, its duration was short, merely during construction, and, therefore, it could hardly give its name to an important architectural treatment; and another derivation has been found for the word "metope" from the Greek word for "forehead" or "front," with probable reference to the prominence of the sculptured metope.

Whatever may be the philological derivation of the metope, Euripides' statement has never been definitely understood. If it is to be imagined that Euripides referred to a small temple *in antis*, it could be well conceived that the ceiling was not closed in below the level of the beams, but was open to the rafters above, in which case the way was clear for Orestes. That these rafters were originally left exposed is shown by Homer's description of the slaying of the suitors in the Odyssey, when Pallas Athenæ perches as a sparrow on the roof beams. On the other hand, it seems more probable that the temple referred to by Euripides was similar to the classic temples with which he was familiar. Iphigeneia is represented as the high priestess and a very important personage in Tauris, and it seems highly probable that Euripides would imagine her temple to be of the largest and finest type, rather than a small primitive temple, which would have been more historically correct. This would be following the analogy of Shakespeare, who in placing his characters and scenes in distant lands and in early times, still conceived them as of his own period. If this point of view can be considered, it gives rise to a rather interesting speculation as to the means by which Orestes entered the temple, as in that case there could be no entrance through the metopes. Could it be possible that the reference here was made to some openings in the roof, such as have been suggested by Mr. Ferguson for the lighting of his temples? If there were, as he has suggested, certain small hypæthral openings masked on the inside by some form of triglyph decoration, these would provide an entrance to the shrine which would be as easy of access as through the metopes, and possibly form a place of concealment in case the robbery was interrupted. It is known that there was some sort of a space above the roof, because there is a record that in the defense of the Heraion a wounded Greek secreted himself there, and his body was not discovered until many years later.

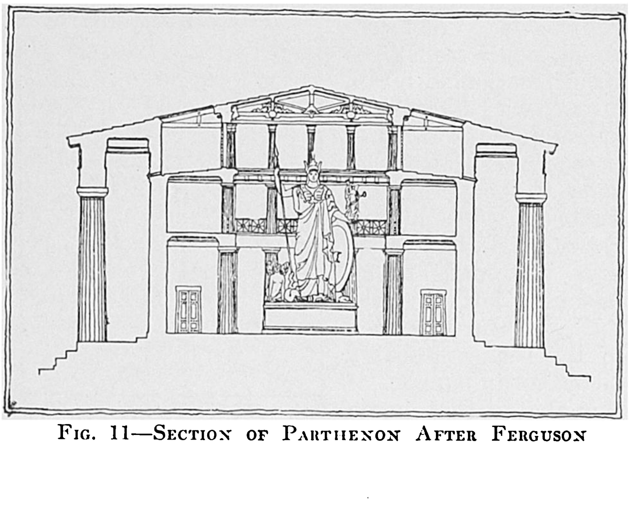

Fig. 11—Section of Parthenon After Ferguson

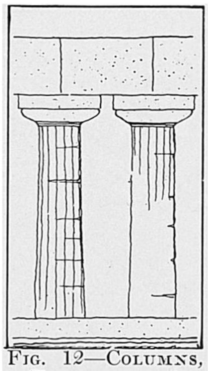

Fig. 12—Columns, Temple of Artemis, Syracuse

Allusion has been made to an objection brought forward to the wood origin of the Doric column, based on the fact that the columns in the early temples were of excessive thickness, and that this proportion gradually diminished to the perfect proportions of the Parthenon, and beyond that to the meagre outlines of the latter work, the idea being that the reverse would happen if the stone columns were copied from a wooden prototype. As a matter of fact, it is not this gradual diminution a perfectly natural result of progress and development, not only from an æsthetic, but from a structural point of view? Is it not always the case that the first use of stone as a building material is hampered by excessive timidity? Stone was a new material, and its primitive users were unwilling to trust too much to its strength. The walls of Assyria and the columns and pylons of Egypt greatly exceeded the structural strength which was demanded from them. As time progressed, and it was found that stone would safely bear a greater weight than had been previously intrusted to it, the columns would gradually diminish in size, until from the massive proportions of Sicily they had attained the slightness of the later temple at Cori. It may also be possible that in the early times there were certain failures of lintels or columns, due to the presence of dry seams or other structural defects which were then unsuspected. In any event, the first use of stone by the Greeks, as by the other nations of antiquity, was marked by an excessive timidity. This extended not only to the columns but to the architrave supporting the entablature. In the very early examples, the excessively heavy columns were placed so near together that their projecting abaci nearly touched; an outline of these columns in their relation to each other and the entablature above recalling very strongly the stepped domes of

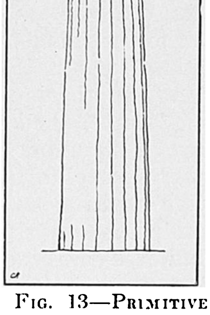

Fig. 13—Primitive Relation of Architrave and Abacus, Paestum

the Mykenian age. That this extreme projection of the abacus was merely for the purpose of reducing the span of the architrave is shown by the fact that the primitive architrave was no wider than the upper diameter of the column, and consequently, viewed across the corner, the load supported by the abacus was not at all in keeping with this excessive projection. This was early apparent to the Greeks, and not only was the projection of the abacus gradually reduced, but the architrave itself was widened, until in the Parthenon is projected considerably beyond the upper face of the column. This gradual development was dictated by purely architectural reasons, and forms an important step in a hypothesis regarding the proper relation between the lower face of the architrave and the upper face of the column or pilaster, which will be the subject of a later article.

Egerton Swartwout

(To be continued)

[The public will now begin to understand why Greek architecture has persisted in arousing the admiration of mankind for twenty-five centuries in spite of all the efforts of the extreme "individualists" to substitute other styles for the purpose not only of novelty but in order to destroy the eternal popularity of the Greek styles which, on account of their persistent and universal popularity, we call Classic. And how the enemies of the classic were aggrieved when they saw even the Japanese succumb to its charm and adopt more or less classic forms in some of their modern structures! Of course, no one expects any one to slavishly copy any Greek building of the past. 'Twould be foolish to insist upon it. But that the elements and spirit of Greek architecture will be used in the future as in the past, in grandiose buildings, is assured by the fact that they incarnate the motto: "The True, the Good and the Beautiful" more than any other styles of architecture ever developed by men.—Editor.]

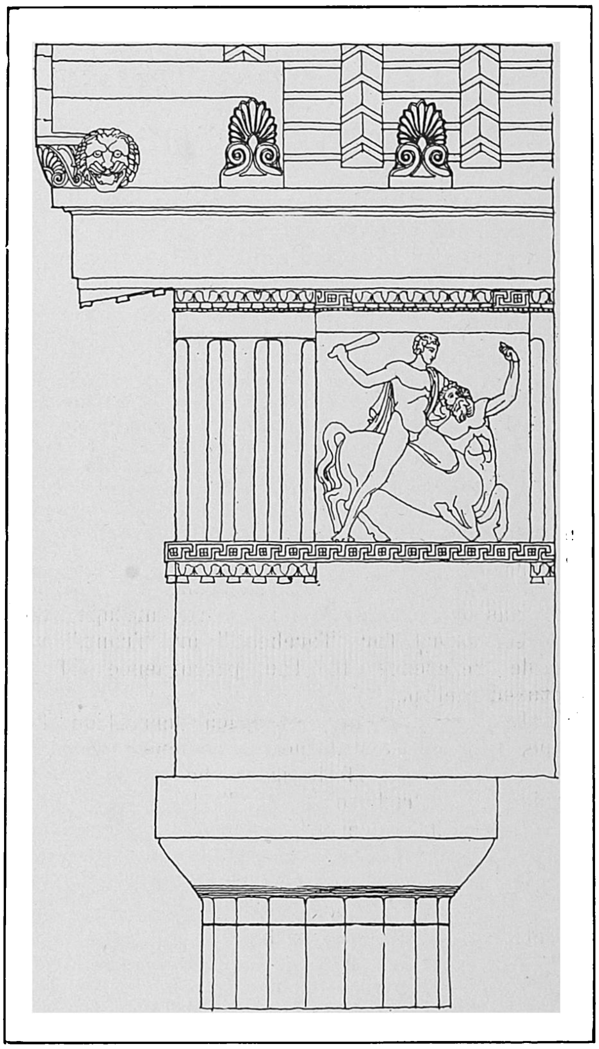

Fig. 14—Relation of Architrave and Abacus, Parthenon

THE SAINT OF THE FLOWERS

I read, in an old book unknown to fame,—
It might have been a volume of the Hours,—
Of a sweet saint of long forgotten name,
A saint who loved the flowers.

She tended them within the cloister close
Devoutly, bending the fair blooms above;
The lily and the violet and the rose
Gave back to her their love.

And so, when she passed on to paradise,
She who was like a flower, they faded too,
Closing like her on earth their earthly eyes
For dawns of heavenly dew.

Hence evermore I dream about her there,
Throughout the long celestial golden hours,
Still tending them with her untiring care,
The saint who loved the flowers!

Clinton Scollard